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APPLIED FORESTRY NOTES

NORTHERN ROCKY MOUNTAIN
FOREST AND RANGE EXPERIMENT STATION
AND
COOPERATING AGENCIES*

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ROCKY MOUNTAIN STATION

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The following rating of the character of the 1934 fire season in western Montana and northern Idaho has been prepared for the benefit of timber protective agencies who do not as yet have all the facilities necessary for measuring forest fire danger. As some of the agencies may not be familiar with the method used, the important features have been outlined. The Northern Rocky Mountain Forest and Range Experiment Station plans to issue a similar rating annually hereafter.

L. F. Watts, Director.

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The Rating of Forest Fire Danger

by

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At the end of each fire season every agency responsible for forest fire control attempts to justify its existence by summarizing its records and showing that in spite of the fire danger that existed, the timber losses, area burned, and expenses were less than they might have been. Sometimes these attempts are entirely successful; other years the Forester at Washington may doubt that the Region did as well as it might have; the head of the National Park Service may call for more information; the Chief of the Indian Service may investigate personally; the State Board of Forestry may be rather skeptical concerning the State Forester's report; and the private timber protective association directors may conclude that they need a change of fire wardens. When this is the case, it is usually for the reason that the higher authorities doubt that the character of the fire season warranted the losses and costs shown by the report.

Every annual report of forest fire control should, therefore, state: first, the character of the fire season; second, the losses and costs; and third, the reporting officer's explanation of the efficiency or lack of efficiency shown. If the character of season is not shown fully and dependably, it may be that the reporting officer prefers not to be too explicit, or it may be that methods of measuring and describing the character of season were not available. Until recently satisfactory methods have not been at the disposal of all agencies.

During the past several years the Northern Rocky Mountain Forest and Range Experiment Station has been studying differences between fire seasons, the factors of fire danger, methods of measuring these factors, and the development of a scale for rating the character of a fire season. The latter has been especially needed because even with quite complete measurements of weather, fuel moisture, visibility, etc., the reporting officer could, according to the factors which he chose to emphasize, produce a danger rating generally suiting his needs. Certain factors of fire danger are recognized as of major importance, however, and always should be included in such a report. Furthermore, uniform rating of fire danger demands that these factors be integrated in the same way by all individuals, otherwise the final classifications of danger are not likely to be comparable, either from year to year or between agencies.

In the Northern Rocky Mountain scheme the factors selected for daily measurement include: (1) season of the year, (2) activity of man and lightning as causative agencies, (3) visibility distance or ease of detection, (4) afternoon fuel moisture or inflammability, (5) afternoon wind, and (6) minimum, or 5 p.m. relative humidity. These are integrated by use of a device called a Fire Danger Meter so that danger is expressed in seven classes. When all factors are most favorable for fire control, the meter integrates them and shows Class 1, or lowest danger. When all factors are most unfavorable the meter will show Class 7, or highest possible danger. Field tests on each of the National Forests in this Region during the 1933 and 1934 fire seasons have shown that when conditions were recognized as uniform over several Forests the meter ratings were similar, and that when the meter ratings differed there were real differences in fire danger.

By use of these daily measurements and ratings it is now possible to describe fire danger on a numerical scale just as the thermometric scale is used to describe

heat. The person without a thermometer can only report to another by use of such general terms as hot, pretty hot, quite hot, "darned" hot, etc., which are neither specific, accurate, nor comparable, but a report of a temperature of 96° F. is specific, as accurate as the thermometer, fully comparable with previous measurements with that same instrument, and is understood by every one. After the new scale for fire danger has been used for a season, the user learns the exact significance of each class of danger, understands what others mean when they use that scale, and is able to compare one day with another, or one year with another.

It is also possible now to express fire danger as a percentage of the worst probable danger. This is desirable because expressions of percentage are readily visualized by everyone including the higher authorities who may not have the time to familiarize themselves either with the technicalities of measuring fire danger or with the significance of classes of danger.

Using this method of description, the peak months of July and August, 1934, rated as follows on the fire Forests of western Montana and northern Idaho: Bitterroot 80%, Cabinet 88%, Clearwater 89%, Coeur d'Alene 82½%, Flathead-Blackfeet 92½%, Kaniksu-Pend Oreille 80%, Kootenai 84%, Lolo 89%, Nezperce 90%, old Selway 83½%, and St. Joe 81½%. By weighing these ratings according to the area represented, it is then possible to state that the average fire danger on these 16,195,000 acres of forest land was 86% of the worst probable. By comparison with similar measurements for the same area during July and August, 1933, it is found that forest fire danger was 12% greater in 1934 than in 1933.